

4. (Amended) Synthetic vegetal melanins according to claim 2, wherein the plant polyphenol of formula (I) with X being a residue of formula (III) is a flavonoid anthocyanins selected from the group consisting of cyanidin, delphinidin and mixtures thereof.

5. (Amended) Synthetic vegetal melanins according to claim 2, wherein the plant polyphenol of formula (I) with X being a residue of formula (IV) is an open ring dihydroxyphenol selected from the group consisting of hydroxytyrosol, protocathechuic acid, protocathechuic aldehyde, gallic acid, tannic acid and mixtures thereof.

6. (Amended) Synthetic vegetal melanins according to claim 1, comprising said eumelanin precursor wherein the eumelanin precursor is selected from the group consisting of L-dopa, DHI, DHICA, dopamine, pyrocatechol, pyrogallol and mixtures thereof.

7. (Amended) A method of producing synthetic vegetal melanins according to claim 1 comprising bubbling air or oxygen through an alkaline aqueous solution comprising the at least one monomer at a pH of at least 10, during 12 to 48 hours, at a temperature ranging from 10 to 90°C.

8. (Amended) A method of claim 7, send alkaline aqueous solution further comprising catalytic amounts of pro-oxidant metals selected from the group consisting of Cu⁺⁺, Fe⁺⁺, Ni⁺⁺, Co⁺⁺ and mixtures thereof.

9. (Amended) A method of producing synthetic vegetal melanins according to claim 1 comprising polymerizing at the least one monomer with a chemical oxidizing agent selected from the group consisting of hydrogen peroxide, hydrogen iodide, ammonium persulfate, potassium permanganate, magnesium perchlorate and mixtures thereof.

10. (Amended) A method of producing synthetic vegetal melanins according to claim 1 comprising bubbling air or oxygen through an buffered aqueous solution comprising the at least one monomer at a pH from 9.5 to 4.5, during 12 to 48 hours, at a temperature ranging from 20 to 45°C in presence of a melanin-forming enzyme.

11. (Amended) Method of claim 10, wherein the enzyme is selected from the group consisting of tyrosinases, polyphenoloxidases (catachol oxidases), phenolases, (phenoloxidases), peroxidases, laccases, lipoxygenase, and mixtures thereof.

12. (Amended) A method according to claim 10 wherein the monomer units (a) or(b) are formed in situ from pre-momomers, bearing a monophenolic moiety.

13. (Amended) A method of claim 12 where the pre-momomers are selected from the group consisting of dihydrokaempferol, armadendrin, p-hydroxybenzaldehyde, PHBA, tyrosol, p-coumaric acid, apigenin, kaempferol, pelargonin, genistein, tyrosine, tyramine, 5-hydroxy-indole and mixtures thereof.

14. (Amended) A cosmetic composition comprising as active ingredient at least one synthetic vegetal melanins according to claim 1.

15. (Amended) A cosmetic composition according to claim 14, including additives for facial make-up, hair dyes, tanning, anti-sun, toiletry, or for moisturizing and protective skin.

16. (Amended) A pharmaceutical or nutritional composition having anti-inflammatory and immunomodulation activity which comprises as active ingredient at least a synthetic vegetal melanin according to claim 1.

PLEASE ADD THE FOLLOWING NEW CLAIMS:

17.(Amended) Synthetic vegetal melanins according to claim 2, comprising said eumelanin precursor wherein the eumelanin precursor is selected from the group consisting of L-dopa, DHI, DHICA, dopamine, pyrocatechol, pyrogallol and mixtures thereof.

18.(Amended) Synthetic vegetal melanins according to claim 3, comprising said eumelanin precursor wherein the eumelanin precursor is selected from the group consisting of L-dopa, DHI, DHICA, dopamine, pyrocatechol, pyrogallol and mixtures thereof.

19.(Amended) Synthetic vegetal melanins according to claim 4, comprising said eumelanin precursor wherein the eumelanin precursor is selected from the group consisting of L-dopa, DHI, DHICA, dopamine, pyrocatechol, pyrogallol and mixtures thereof.

20.(Amended) Synthetic vegetal melanins according to claim 5, comprising said eumelanin precursor wherein the eumelanin precursor is selected from the group consisting of L-dopa, DHI, DHICA, dopamine, pyrocatechol, pyrogallol and mixtures thereof.